

juicedLinkTM

User's Manual

Camcorder XLR Adapter/Preamp/Mixer - Family of Products

CX211, CX231, CX411, CX431, CX471



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Read This First

Before operating the unit, please read this manual thoroughly.

Although there are numerous combinations of settings for the mixer gain plus recording device gain (camcorder) that will result in the identical signal levels, they will have different characteristics in terms of noise and dynamic range. This manual provides guidelines and practices to yield the best overall signal purity.

Any future revisions will be posted on the website and available for download.

Some of the features described in various sections may not be available on your model. Please refer to the *Feature Comparison Chart* to determine the capabilities of your particular device.

Notes regarding documentation in this manual are as follows:

- References to markings/labels on the unit are denoted in underline/bold. For example: **HPF**.
- Warnings will be preceded with **WARNING**.

Warnings - General

WARNING: Failure to read and observe notes and warnings may result in personal injury, and/or possible damage to this device and your other equipment.

WARNING - LOSS OF HEARING: Although headphones do not plug directly into this mixer, it is common for headphones to be used with other equipment to monitor the audio signal transmitted by the mixer. The devices that are driving the headphones, such as camcorders, are often capable of driving the signal at levels that can be damaging to hearing. Always operate the headphone volume at the lowest practical level. Do not wear the headphones over your ears in any of the following circumstances:

- While plugging the headphones into the headphone driving device.
- While plugging the mixer into the headphone driving device.
- While turning on or off the mixer.
- While turning on or off the phantom power.
- While plugging a device into the input of the mixer.

WARNING - RISK OF ELECTRICAL SHOCK: This device, its enclosure, and the connections to cable shields that plug into this device are conductive. Avoid electrocution and observe caution with cable runs near areas where high-voltages and/or currents may exist.

Checking Supplied Items

Your package should include the following items:

- Ultra-Portable Mixer model that you purchased.
- 9-inch cable with stereo male 3.5mm plugs on each end.
- 1/8 inch hex key
- Quick Start Guide

General

Some of the features described in this and other sections may not be available on your model. Please refer to the *Feature Comparison Chart* to determine the capabilities of your particular device.

Features

- Family of 2 and 4 input Camcorder XLR Adapter/Preamp/Mixers
- Inputs
 - Precision laser-trimmed active balanced inputs for use with professional mics
 - Un-balanced capable (e.g. wireless mic receivers) - connect pin 1 to pin 3
 - Low-noise preamplifier, 3 adjustable gain settings
 - Line level signal input attenuator switch (first 2 channels)
- Output
 - 3.5mm stereo jack
 - Amplified Mic Level
 - Driver protection from external DC voltages generated by some camcorders
- True channel mixer, with L/C/R pan switches
- Frequency response of +/- 1dB max from 20Hz-20KHz
- Low battery indicator
- Construction
 - Aluminum chassis (black anodized) for EMI protection and rugged use
 - Flexibility to mount under camcorder, on top of tripod, small enough to use with camcorder hand strap, facilities for connection to shoulder strap (shoulder strap not included)

Optional Features

- High Pass Filters (low-cut filters), reduces audible rumble from wind
- Audio Level Metering - 10 segment LED per R/L - Adjustable
- 48V phantom power
- Power saving 12V phantom

Feature Comparison Chart

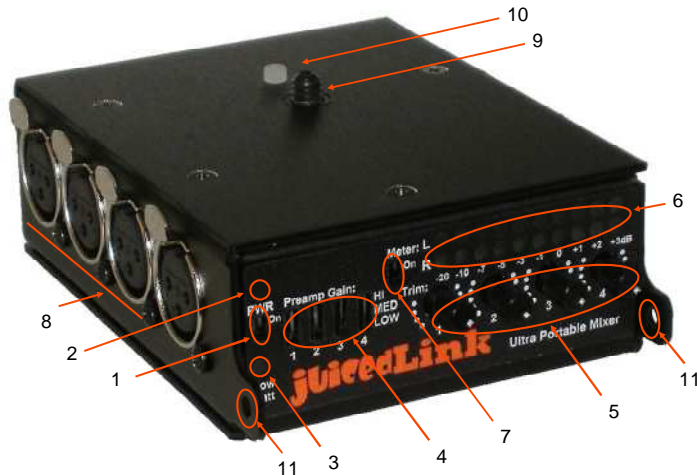
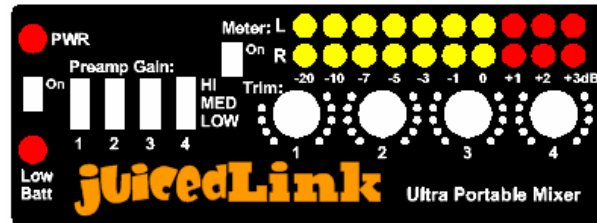
| Features | CX211 | CX231 | CX411 | CX431 | CX471 |
|---|-------|-------|------------------|------------------|------------------|
| Inputs | | | | | |
| XLR input channels | 2 | 2 | 4 | 4 | 4 |
| Low noise preamp - High/Med/Low gain | yes | yes | yes | yes | yes |
| Precision active input balance | yes | yes | yes | yes | yes |
| Line level switch | yes | yes | yes ¹ | yes ¹ | yes ¹ |
| Signal Processing | | | | | |
| True Mixer - per channel L/R/C pan switch | yes | yes | yes | yes | yes |
| Per channel low-cut filter | - | - | - | - | yes |
| Outputs | | | | | |
| 3.5mm stereo | yes | yes | yes | yes | yes |
| Phantom Powering | | | | | |
| 48V Phantom | - | yes | - | yes | yes |
| 12V Phantom power saving mode | - | yes | - | yes | yes |
| Indicators | | | | | |
| Low Battery Indicator | yes | yes | yes | yes | yes |
| Audio Level Meter - 10 segment LED L/R | - | - | - | - | yes |

Notes:

1) Line switches available for first 2 channels on 4 channel mixers.

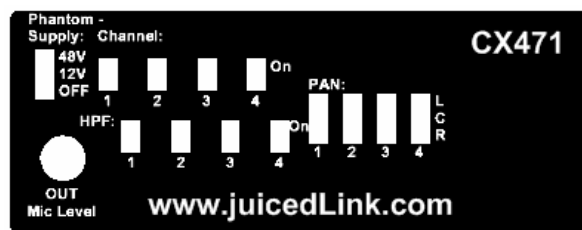
Panel Descriptions

FRONT



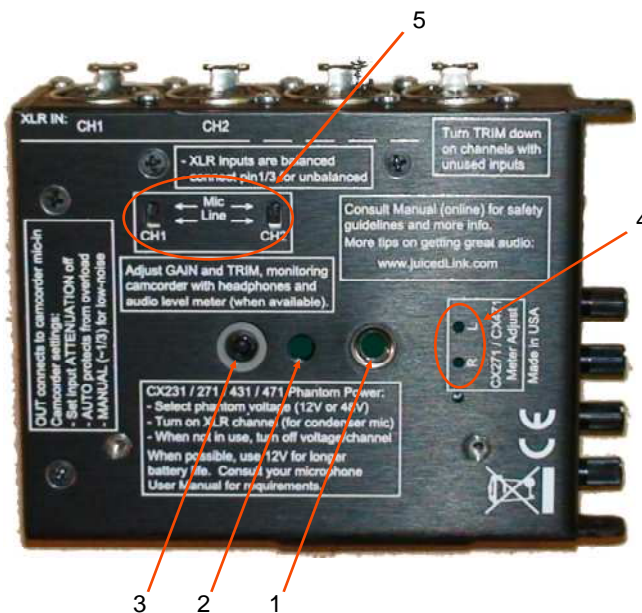
- 1) POWER SWITCH
- 2) "ON" LED INDICATOR
- 3) LOW BATTERY INDICATOR
- 4) PREAMPLIFIER GAIN SETTINGS
- 5) TRIM POTENTIOMETERS
- 6) AUDIO METER DISPLAY (RIGHT/LEFT)
Not available on all models.
- 7) AUDIO METER POWER SWITCH
Not available on all models.
- 8) XLR INPUTS
- 9) UNDER-CAMERA ATTACH SCREW
- 10) AZIMUTH PIN (removable)
- 11) SHOULDER STRAP CONNECTION POINTS
Shoulder strap not included.

REAR



- 1) STEREO MIC LEVEL OUTPUT
- 2) PHANTOM POWER "ON" / VOLTAGE SELECT
Not available on all models offering phantom power.
- 3) PHANTOM POWER INPUT CHANNEL ROUTING SWITCHES
Not available on all models.
- 4) PER CHANNEL HPF SWITCHES
Not available on all models.
- 5) PER CHANNEL PAN SWITCHES
- 6) 9V BATTERY TRAY
Battery not included.

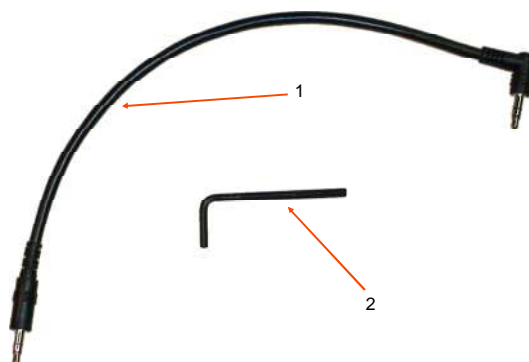
BOTTOM



- 1) TRIPOD MOUNT
- 2) AZIUMUTH HOLE
- 3) UNDER-CAMERA ATTACH SCREW:
1/8" hex key included.
- 4) AUDIO METER ADJUST (R/L)
Not available on all models.
- 5) INPUT ATTENUATOR (MIC/LINE) SWITCH

Note: The bottom of the unit is silk-screened with handy tips and instructions.

INCLUDED



- 1) SHIELDED STEREO MINIJACK OUTPUT CABLE
- 2) TRIPOD SCREW ALLEN WRENCH KEY

Input Connection

Some of the features described in this and other sections may not be available on your model. Please refer to the *Comparison Chart* to determine the capabilities of your particular device.

Unused XLR Inputs

When a preamp does not have an input connected to it, the preamp is presented with a high impedance. When a preamp is presented with a high impedance, it will produce a lot of noise. So, for any XLR input channel that does not have an input connected to it, make sure to turn the corresponding **TRIM** down all of the way.

Input Attenuator (MIC/LINE)

Channels 1/2 have a 40dB input attenuator switch on the bottom of the unit that can be engaged to protect the input preamp from overloading in the presence of high signal levels. If connecting line level signals to the input of either channel 1 or 2, then set the corresponding attenuator switch to **LINE**. Similarly, if connecting microphone level signals, then set the attenuator switch to **MIC**.

Channels 3/4 in 4 channel mixers are not equipped with input attenuators. They are to be used with microphone level signals, similar to the **MIC** setting.

The 3.5mm output plug connections from the receivers of wireless microphone systems can be treated as microphone level signals. It is reasonable to assume that if the output from a product was intended to go into the microphone input of the camcorder, then the **MIC** setting on the mixer should be used.

Phantom Powering Condenser Microphones

12/48V phantom power is not available on all models.

Condenser microphones require a voltage for operation. Some microphones have facilities for an internal battery. Other microphones need to be operated from phantom power, which is when the voltage is generated by the device that the microphone cable plugs into on the other end from the mic, and the voltage is transmitted up the microphone cable.

There are some advantages to phantom powering mics. On some mics, their specs are improved when operating from phantom power instead of the internal battery. Microphones that operate from phantom only tend to be shorter and lighter (since they don't have a battery or battery compartment), so they are easier to boom (remember, you should be getting the mic off of your camcorder and booming frequently to get the mic closer to the source for the best microphone placement).

The internal switching power supply generating the will generate a phantom voltage corresponding to the switch **12V** and **48V** switch positions. When phantom power is not in use, then leave the internal switching power supply in the **OFF** position to conserve battery life.

Once the switching power supply voltage has been selected and is being generated by the internal switching power supply, power can be supplied to the individual channels. This is accomplished by setting the **Phantom** channel switches (**1**, **2**, etc.) to the **On** position. Then, the phantom voltage is supplied to pins 2 and 3 on the activated channels through current limiting resistors.

Many older condenser microphones will operate from 48V only. The phantom voltage should be set to **48V** if any of your microphones require 48V.

However, there are many modern condenser microphones which are specified for 11-52V operation. If all of you're the condenser microphones being used can operate down to 12V, then use the **12V** setting for the phantom voltage. This will significantly increase battery life, since the switching power supply will not have to work as hard to boost the voltage from 9V to 12V (compared to boosting it to 48V).

WARNING – HIGH DC VOLTAGES CAN POTENTIALLY DAMAGE OUTPUT DRIVERS ON ELECTRONIC EQUIPMENT. Use care, heed warnings, and follow guidelines when using phantom power.

WARNING – USE PHANTOM POWER FOR CONDENSER MICROPHONE INPUTS ONLY: Only activate phantom power to channels using condenser microphones. Supplying phantom power to dynamic microphones is not a recommended practice, even though there is no voltage potential between pins 2 and 3 and theoretically should not cause damage. Supplying phantom power to other types of electronic equipment, whether balanced or unbalanced, can potentially damage their output drivers.

Use the following best practice procedure for phantom powering:

- 1) Connect only a condenser microphone to the desired mixer input.
- 2) If *all* of the channels requiring phantom power are using condenser microphones that allow for the use of 12V, then set the voltage selector switch to **12V**.
- 3) If *any* of the channels needing phantom power are using a condenser microphone requiring 48V, then set the voltage selector switch to **48V**.
- 4) After all of the desired condenser microphones are plugged in, then set corresponding the **Phantom** channel switches to the **On** position.
- 5) After use is complete, turn off all of the **Phantom** channel switches before removing the condenser microphones, and turn the phantom power supply to **OFF**.
- 6) Unplug the condenser microphone.

Use with Unbalanced Sources (Wireless Mics, Etc)

XLR inputs have 3 pins (3 connections for a single audio signal). Pin 1 is for ground. The audio signal is present on pins 2 and 3, and is what is known as a “balanced” signal. That is to say that the signal on one wire is identical but opposite in polarity to the other (pin 2 is known as “hot” or the positive polarity). Balanced signals when terminated properly (as in the juicedLink) have a high immunity to picking up noise and interference. This is especially important for microphone level signals and cable runs longer than a few feet.

There are times when you will want to interface to unbalanced signals. This is where a single audio signal is reference to ground (only 2 connections for a single audio signal). For example, many wireless receivers output an unbalanced signal.

The juicedLink XLR inputs can interface with unbalanced sources. To do this, a simple modification to the cable/plug that will be inserted into the mixer input is required. Connect pins 1 and 3 together for the signal ground. Pin 2 remains as the input signal.

So, for a wireless receiver that uses a 3.5mm plug for its output, the audio signal will be on the “tip”, and the ground will be on the “sleeve”. The plug “sleeve” needs to be connected to XLR pins 1 and 3, and the plug “tip” needs to be connected to XLR pin 2.

Fortunately, many wireless kits (such as the Sennheiser G2) come with a minijack to XLR cable which already makes this connection.

For those kits which do not come with the appropriate cable, you will need to use some inexpensive adapters.

One inexpensive handy adapter is the Rode VXL. However, you will need to be careful. The VXL makes a connection between the minijack “sleeve” and “ring”. For a miniplug which has a “tip”, “ring”, and “sleeve”, this is not a problem. But, on some inexpensive wireless kits (from Azden), the output miniplug connects the “ring” and “sleeve” together. So, the VXL is not usable for such plugs.

Here are some other inexpensive adapters which are handy for connection to unbalanced signals:

- XLR(M) to 3.5mm(F): Rode VXL (be careful ... see above)
- XLR(M) to RCA(F): Hosa GXM133
- RCA(M) to 3.5mm(F): Comprehensive PP-MJ
- Stereo 3.5mm(F) to two mono right/left RCA(M): Hosa YMR-197

WARNING – DO NOT ACTIVATE PHANTOM POWER ON XLR INPUT CHANNELS CONNECTED TO UNBALANCED DEVICES. The voltage from the phantom power can damage these devices. See the warnings in the *Phantom Powering Condenser Microphones* section of this manual.

Output Connection

Output Signal

The output of the juicedLink is an amplified mic level signal. The juicedLink is not intended to drive line level signals. It is not necessary to have a lot of gain to interface with a camcorder. You want just enough gain to be able to throttle back the noisy camcorder amplifiers, to yield improved signal-to-noise performance while recording fine audio detail. Too much gain would overload the camcorder.

Connection to Camcorder

Connect the plug from one end of the shielded cable to the **OUT** 3.5mm stereo jack on the mixer. Connect the plug from the other end of the cable to the camcorder's microphone input jack. The camcorder's integrated microphone will now be disabled.

Some camcorder microphone input jacks supply low voltage DC for powering external microphones. Therefore, the mixer output driver has been protected from external voltages with DC blocking capacitors. Large capacitance values have been selected to provide excellent low frequency response.

Connection to Recorders, Computers, etc.

The output of the juicedLink can be connected to any recording device expecting stereo minijack mic level signals.

Audio Settings

General Principles and Guidelines

HEADPHONE MONITORING: To be certain that your camcorder and mixer settings are optimized for the signal being recorded, it is a best practice to monitor the audio using headphones driven by the camcorder. A meter may indicate if there is sufficient signal. However, a meter gives you no indication of signal-to-noise. The signal level may be fine, but the audio could still sound poor. This could be because of noise (background, echo, failing mic) that you would not realize is present. So, it is a best practice to always monitor with headphones. Follow hearing safety guidelines in the *Warnings* section of this manual.

DISTRIBUTION OF CAMCORDER/MIXER GAIN: There are numerous combinations of gain settings between the camcorder and mixer that will result in identical signal levels. However, each combination has unique properties in terms of noise and dynamic range. The mixer preamp is, in general, a lower noise device than the front end of most camcorders. Better signal purity will result with the camcorder set to a low gain level, and let the juicedLink low-noise preamps do the heavy lifting for the gain. This is controlled via various methods for different camcorders. Higher-end camcorders will have a switch to turn off the AGC, then potentiometers to control the gain. Having the potentiometers adjusted to approximately 1/3 level is a reasonable starting point. Some camcorders (such as many of the Sony HDR series) may have a LOW setting. Although this does not turn the AGC off, it sets it at a much lower level (injecting less noise).

CAMCORDER AGC: Automatic Gain Control (AGC) is circuitry that increases the gain for low signals, then cuts back the gain for large signals. This is helpful to even out the audio for near/far sources, and prevent overloading of the recording circuitry. There are definitely environments where AGC is called for, especially where signal levels can vary greatly and be unpredictable. We chose not to implement a separate limiter in the mixer, since you have the option to use AGC in your camcorder (and the limiter would add noise and burn current). The downside of the AGC circuitry is that it always searches for some signal to amplify. During periods of low audio signal levels, the AGC will start amplifying the ambient noise in the room, or other unwanted noise. If your environment's signal levels are generally constrained or more predictable, then the recorded audio quality will improve greatly by turning the AGC off.

UNPREDICTABLE SIGNAL LEVEL ENVIRONMENTS: In unpredictable signal level environments (say, a kids birthday party), the wide dynamic range and overload protection of the camcorder's AGC circuitry.

RECORDING FINE AUDIO DETAIL: It is desirable to get the best noise performance from your equipment while recording fine audio detail, such as dialogue. In these cases, set your camcorder to manual and throttle back the gain to roughly 1/3 the level. Then, turn up the trim on the juicedLink's low-noise preamps. This turns down the camcorder's noisy amps, and replaces it with the clean gain from the juicedLink.

Selecting Mixer Preamp Gain

Read the *Input Attenuator* section for instructions on selecting the appropriate attenuator position.

There are 3 preamp gain settings (**HIGH**, **MED**, and **LOW**). Having a number of gain settings to choose from allows for an optimal adjustment range of the **TRIM** control. With microphone inputs during normal use, you will find that you will be mostly on the **HIGH** setting. The **MED** and **LOW** settings will mostly come into play if you are using extremely sensitive mics in very high SPL environments.

Adjusting Trim

On unused XLR input channels, turn down the **TRIM** all of the way. This removes the possibility of unused channels adding noise to the output signal. Each channel is buffered, so this can be done without adversely loading or effecting adjacent channel signal-to-noise ratio (unlike many passive adapters).

Read the previous sections *DISTRIBUTION OF CAMCORDER/MIXER GAIN* and *CAMCORDER AGC* for an understanding of the principles and guidelines for the camcorder and mixer gain settings.

Monitor using headphones and adjust the **TRIM** potentiometers to achieve the desired relative signal level between the various channels used.

Metering

The audio meter feature is not available on all models.

First, the meter will need to be calibrated to your camcorder's settings. Once calibrated, changing camcorder settings will result in the meter being uncalibrated. Calibration can be performed to correlate with an existing meter on the camcorder. Calibration can also be setup empirically by speaking a constant level tone into a microphone, increasing the gain until clipping internal to the camcorder, then backing off the gain to a safe level, then adjusting the meter to the **0dB** reference.

The meter is adjusted by using a small screw with the **Meter adjust right** and **left** potentiometers.

Mixing (Pan Switch)

This device is a true channel mixer, providing independent signal routing control for each input channel via the **PAN** switches. **L** routes the input signal for the corresponding channel (**1** through **4** for 4 channel mixers) to the left mix bus. **R** routes the input signal for the corresponding channel to the right mix bus. **C** routes the input signal for the corresponding channel equally to both the left and right mix buses.

High-Pass Filter

The high-pass filter feature is not available on all models.

High-pass filters, also known as low-cut filters, are used to reduce excess low frequency energy from the audio signal. An instance where this is useful is when low frequency rumble results from wind rushing across the microphone. The design is to have the -3dB point centered at 180Hz, with a rolloff of -6dB/octave.

To engage the high-pass filter, slide the **HPF** switch for the corresponding input channel (**1**, **2**, etc) to the **On** position.

Power

Power Sequence

- Place an alkaline 9V battery in the tray. Make certain to use the correct orientation.
- Turn on the power by sliding the **PWR** switch to the **On** position.
- The "ON" LED will now be illuminated.
- Turn off the power when not in use to conserve the battery.
- The low battery indicator LED (**Low Batt**) will illuminate when the battery supply needs to be changed. The threshold has been preset for use with alkaline 9V batteries.

Rechargeable Batteries

It is not recommended to use the unit with rechargeable batteries. The low battery indicator has been calibrated for use with alkaline 9V batteries. Other battery types will not illuminate the low battery indicator the appropriate voltage for that type of battery.

Mounting

Positioned Under Camcorder

Rotation Secured with Azimuth Pin

Align the azimuth pin and mounting screw on top of the mixer, with the corresponding holes on the bottom of the camcorder. Use the 1/8" hex key (provided) to tighten the mounting screw. Check to make sure that the connection is tight enough, and the azimuth pin is constraining rotation between the two.

Rotated Position – Unsecured

There may be circumstances where you wish to have the XLR connectors and cables protruding from your setup in a different orientation from the one secured from the azimuth pin. The azimuth pin may be removed, providing freedom of rotation. Only use this configuration while you are shooting and holding the camcorder itself with your hands.

WARNING - PHYSICAL DAMAGE TO YOUR EQUIPMENT SET MAY RESULT IF YOU USE THE TRIPOD MOUNT ON THE BOTTOM OF THE MIXER TO SECURE YOUR EQUIPMENT SET, AND THE CAMERA IS MOUNTED TO THE MIXER WITHOUT SECURING THE ROTATION BY USING THE AZIMUTH PIN.

Mounted to Tripod

First, follow the directions to mount the camera to the top of the mixer. Make sure that the rotation is secured with the azimuth pin.

Next, align the azimuth pin and screw from the tripod head with the holes on the bottom of the mixer, and tighten. Make sure that the rotation at this point is also secured by the tripod head azimuth pin.

WARNING - PHYSICAL DAMAGE TO YOUR EQUIPMENT SET MAY RESULT IF YOU USE THE TRIPOD MOUNT ON THE BOTTOM OF THE MIXER TO SECURE YOUR EQUIPMENT SET, AND THE CAMERA IS MOUNTED TO THE MIXER WITHOUT SECURING THE ROTATION BY USING THE AZIMUTH PIN.

Other Positions – Shoulder Strap

The aluminum enclosure has the facilities for other methods of attachment, for example, a shoulder strap. If the strap attachments are too large to fit in the holes, then attach a key-ring like device to make attachment holes large enough.

Use of a shoulder strap is preferred to use of a belt clip. With a belt clip, you will have heavy microphone wires tugging at your belt. You don't want to be distracted and miss the shot because you were pulling up your pants.

We have not included a shoulder strap in the package. More customers are mounting to the camera. Also, customers that do want to use a shoulder strap are particular about length and width, etc.

Appendix

Care and Maintenance

Store the mixer without battery in tray to avoid damage from a chemistry leak event.

There is no specific maintenance regimen recommended.

Warranty, Service, and Returns

The design of the juicedLink family of ultra portable mixers is uncompromising in quality and performance, and utilizes top grade professional components. We are proud of our product, and are committed to servicing you to make your customer experience positive.

The *Policies* page on the juicedLink.com website describes the details of the conditions for returns, limited one year warranty, and instructions for obtaining service for your product.

Compliance

This device falls under the classification of FCC part 15, subpart B, section 15.103. Please refer to the FCC part 15 manual for details on conditions of operation.

This device has also been tested to meet CE certification standards.